## NEW CLAIMS 20-39

20. A thermoplastic polymer blend comprising a thermoplastic starch, at least one synthetic polymer, and a hydrolysis component on PVAc basis, wherein the starch component of the polymer blend has a molecular weight which is only minimally reduced relative to native starch, wherein the thermoplastic polymer blend has a bi-continuous phase structure.

21. The thermoplastic polymer blend according to claim 20, comprising extending agents, filling agents, internal lubricants, flow-improving agents, dyes, pigments, or mixtures thereof.

22. The thermoplastic polymer blend according to claim 20, comprising, relative to the total composition of the polymer blend, 30-70 % by weight of the thermoplastic starch, 20-40 % by weight of the synthetic polymer, and 6-25 % by weight of the hydrolysis component on PVAc basis.

23. The thermoplastic polymer blend according to claim 22, further comprising an acidic catalyst component.

24. The thermoplastic polymer blend according to claim 20, wherein the synthetic polymer is a biologically degradable aliphatic polyester or a polyester copolymer or polyvinyl acetate or a polyvinyl acetate copolymer or a water-resistant starch derivative or a water-resistant cellulose derivative or polyvinyl alcohol or a polyvinyl alcohol copolymer.

25. A method for producing a thermoplastic polymer blend by reactive extrusion, the method comprising the steps of:

a) mixing native starch, at least one hydrophobic polymer, a hydrolyzed component on polyvinyl acetate basis, and at least one of lower polyfunctional alcohols and water; and

b) adding an acidic catalyst to the mixture of step a) and extruding the mixture in the presence of the acidic catalyst.

26. The method according to claim 25, wherein the acidic catalyst is an organometallic compound selected from the group consisting of dibutyl tin oxide, dibutyl

tin dilaurate, tetra-2-ethylhexyl titanate, triethanolamine zirkonate, titanate compound chelated with lactic acid, triethanolamine titanate, and alkyl titanate.

27. The method according to claim 26, wherein the mixture comprises 0.5 % to 2 % of the acidic catalyst, relative to the total weight of the mixture.

28. The method according to claim 25, wherein the acidic catalyst is a Lewis acid.

29. The method according to claim 28, wherein the mixture comprises 0.5 % to 2 % of the acidic catalyst, relative to the total weight of the mixture.

30. The method according to claim 25, wherein the acidic catalyst is an acid selected from the group consisting of nitric acid, sulfuric acid, hydrochloric acid, and p-toluene sulfonic acid.

31. The method according to claim 30, wherein the mixture comprises 0.05 to 0.2 % of the acidic catalyst, relative to its total weight.

32. The method according to claim 25, further comprising the step of producing the hydrolyzed component by saponifying polyvinyl acetate to a hydrolysis degree of 20 to 70 %.

33. The method according to claim 32, wherein the polyvinyl acetate is saponified to a hydrolysis degree of 30 % to 55 %.

34. The method according to claim 32, wherein the polyvinyl acetate is prepared as an aqueous dispersion and is saponified at 120 - 140 °C with sodium hydroxide.

35. The method according to claim 32, further comprising the step of adjusting the hydrolyzed component on polyvinyl acetate basis to a residual moisture contents of 15 - 35 %.

36. The method according to claim 25, wherein in the step a) the native starch, the hydrolyzed component on polyvinyl acetate basis, and the catalyst are mixed to a well-flowing powder mixture.

37. The method according to claim 36, wherein approximately 1 % stearic acid, relative to the total weight of the powder mixture, is added to the powder mixture.

38. The method according to claim 36, wherein approximately 1 % silica gel, relative to the total weight of the powder mixture, is added to the powder mixture.

39. The method according to claim 32, wherein the acidic catalyst is metered in a liquid state mixed with glycerin.

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## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The invention relates to a thermoplastic polymer blend comprising thermoplastic starch as well as a method for producing a thermoplastically deformable, biologically degradable polymer blend, that is shape-resistant in water, on the basis of native starch, synthetic polymers, for example, aliphatic polyesters and their copolymers, polyvinyl acetate (PVAc), polyvinyl alcohol (PVOH) and other, preferably biologically degradable synthetic polymers with addition of a hydrolysis component on the basis of PVAc as well as water or/and lower polyfunctional alcohols by reactive extrusion, preferably in double screw extruders. The reaction product can be processed as a function of the product composition by means of conventional processing machines for thermoplastics to injection molded, deep-drawn, and blow molded parts as well as foils with adjustable service value properties, for example, shape resistance in water and biological degradability. The polymer blend according to the invention is also used as a raw material for fibers as well as material for melt film coatings.

### 2. Description of the Related Art

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### SUMMARY OF THE INVENTION

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Based on the ecological goals of employing renewable raw materials to an even greater extent and to economically produce environmentally safe products, it is an object of the invention to provide a polymer blend on the basis of thermoplastic starch with improved properties.

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DESCRIPTION OF PREFERRED EMBODIMENTS

The invention will be explained in the following with the aid of several examples.